PROPOSED PLAN

MARTHA C. ROSE CHEMICALS, INC. SITE

HOLDEN, MISSOURI

PREPARED BY:

ENVIRONMENTAL PROTECTION AGENCY (EPA)

WASTE MANAGEMENT DIVISION

KANSAS CITY, KANSAS

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SECTION 1: INTRODUCTION

This Proposed Plan is issued by the U.S. Environmental Protection Agency (EPA), the lead agency for site activities. The Missouri Department of National Resources (MDNR) is the support agency for this response action. This Proposed Plan identifies the preferred option for remedial action to address the contamination at the Martha C. Rose Chemicals, Inc. (Rose) site, based on available information. In addition, the Plan includes summaries of the other cleanup alternatives considered for the site. The Rose site is at 500 West McKissock Street, immediately north of Missouri Highway 58 in Holden, Johnson County, Missouri, as shown on Figure 1. Holden is approximately 50 miles southeast of Kansas City, Missouri.

The USEPA is issuing this Proposed Plan as part of its public participation responsibility under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA), 42 U.S.C. § 9617(a). The purpose of this document is to facilitate public participation in the remedy selection process by: (1) identifying and providing a discussion of the rationale that supports the preferred alternative; (2) providing a brief summary description of the remedial alternatives that were considered in the Feasibility Study (FS); (3) supplementing the Remedial Investigation/ Feasibility Study (RI/FS) and Administrative Record; and (4) providing the public with an opportunity to comment on all alternative remedial actions. The USEPA, in consultation with the MDNR, will select a final remedy for the site only after a public comment period has ended and the information submitted during this time has been reviewed and considered. Therefore, the public is encouraged to review and comment on all the identified alternatives. This document briefly summarizes information that can be found in greater detail in the RI/FS Reports and other documents contained in the Administrative Record for this site. The Administrative Record file, upon which selection of the response action will be based, is available at the following locations:

Holden City Offices
101 West 3rd Street
Holden, MO 64040
(816) 732-4811

Hours: Mon.-Fri. 8:00 a.m. - 5:00 p.m.

USEPA Region VII Docket Room
726 Minnesota Avenue
Kansas City, KS 66101
(913) 551-7477

Hours: Mon.-Fri. 8:30a.m.-4:30p.m.

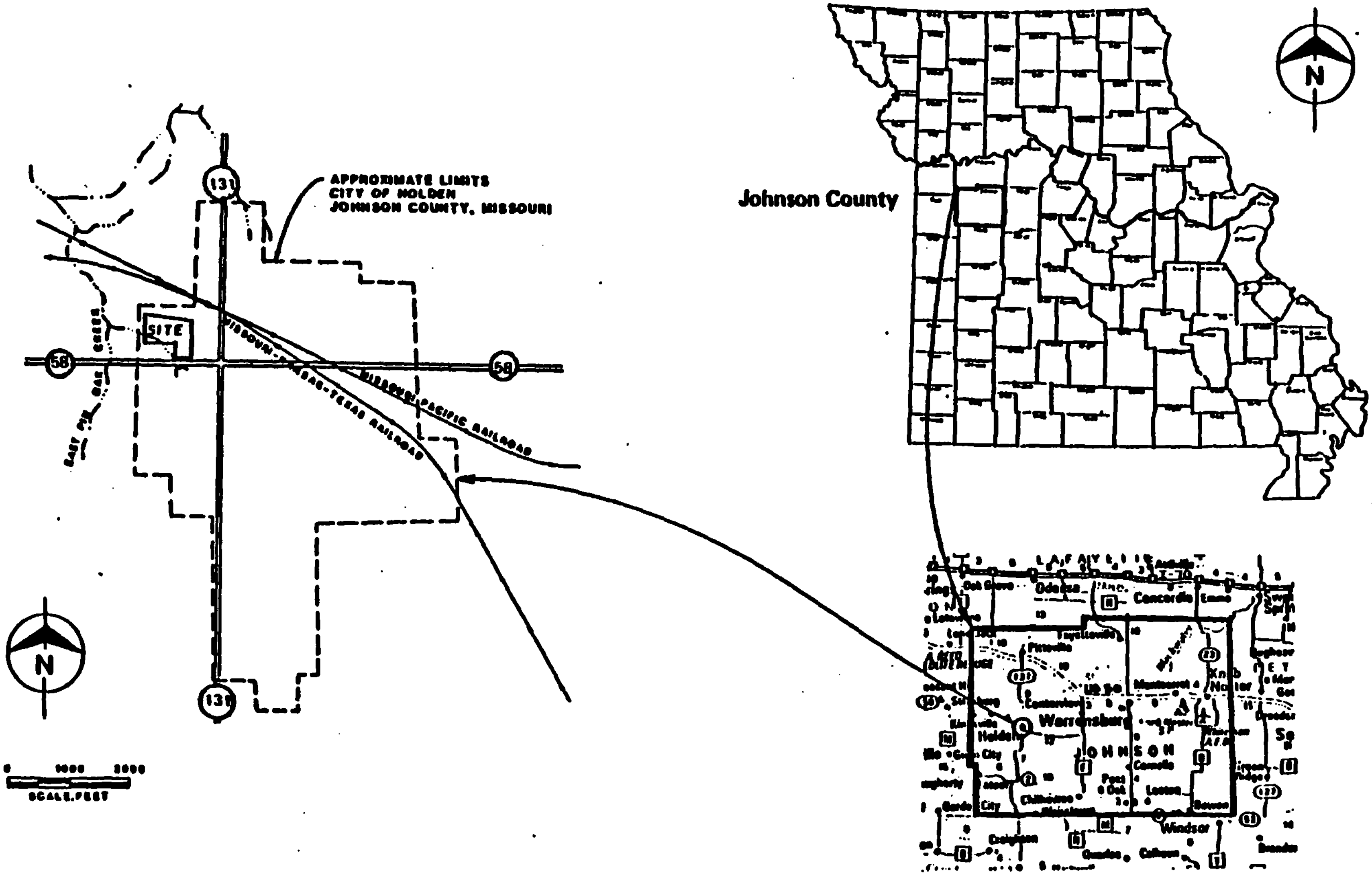

FIGURE 1	ROSE CHEMICALS SITE SITE LOCATION (LOCUS MAP)

Based on new information or public comments, the USEPA, in consultation with the MDNR, may modify the preferred alternative or select another cleanup alternative presented in this Plan and in the RI/FS Reports. Therefore, the public is encouraged to review and comment on all the alternatives identified in this Plan and on the information that supports the alternatives.

SECTION 2: SITE BACKGROUND

The Rose facility consists of two major buildings: the Main Building and the South Warehouse; in addition a small shed, a spill containment pond, and three storm water retention ponds are all located on approximately eleven acres. An intermittent unnamed tributary to East Pin Oak Creek flows through the southwest corner of the Rose property. The property upon which the Rose facility is located, the unnamed tributary, a portion of East Pin Oak Creek and all nearby areas to which contamination from the site has spread comprise the site.

A predecessor to Rose, PCB Eliminators operated a polychlorinated biphenyl (PCB) handling company and used the site as a transfer facility for approximately one year (circa 1981). In 1982, Rose began its PCB operations at the site, which included the following activities: 1) decontamination of mineral oil dielectric fluids; 2) processing PCB capacitors for disposal; and 3) processing PCB transformers for disposal. Rose operated at this location until it abandoned the site in February 1986. During these four years, Rose received approximately 23 million pounds of PCB materials from numerous entities who sent PCB materials to the site for treatment or disposal. When Rose ceased operation in February 1986, it abandoned the site leaving approximately 17 million pounds of generator sent PCB materials and contaminated items onsite.

Pursuant to an Administrative Order on Consent (Docket Number 87-F-0007) issued by EPA on October 29, 1987, a group of potentially responsible parties (commonly referred to as the Rose Chemicals Steering Committee) performed a removal effort from July 1987 to October 1988. PCB-contaminated material, including PCB liquids, capacitors, transformers, other bulk material, and highly contaminated soil, were removed from the site and either incinerated or landfilled.

The Rose Chemicals Steering Committee (Steering Committee) performed an RI/FS at the site, overseen by the USEPA, pursuant to the above-referenced Order from January 1989 to September 1990. The purpose of the RI/FS was to fully determine the nature and extent of the releases or threats of releases of hazardous substances (including PCBs) present at the Rose site, and to evaluate alternatives for appropriate remedial action to prevent or mitigate the release or threatened release of PCBs at and contiguous to and from the Holden facility.

The media sampled during the RI included site soils, ground water, sediments, and site buildings. Subsurface soils in the vicinity of the storm and sanitary sewers leading from the Main Building were found to contain PCBs. Volatile organic compounds (VOCs) were detected in subsurface soils mainly beneath the onsite sanitary sewer and around the former degreasing pit in the South Warehouse. Most of the surface soil contamination occurred over the eastern part of the site where Rose carried out its operations. Concentrations of VOCs were detected primarily in the shallow ground water west of the South Warehouse and north of the Main Building. PCBs were detected in sediment samples from East Pin Oak Creek, the unnamed tributary, the onsite spill containment pond, and the drainage ditch leading to the onsite storm water retention pond. Concentrations of VOCs were detected in sediment samples from East Pin Oak Creek. PCBs were detected in exterior and interior wipe samples from both the Main Building and the South Warehouse. Concrete core samples from both buildings were also contaminated with PCBs. VOCs were found mainly in subsurface soil samples collected from beneath the South Warehouse near the former degreasing pit, and near the north door of the Main Building where solvents were reportedly used and stored. The Risk Assessment concluded that the VOCs detected did not represent a major health concern.

SECTION 3: SCOPE AND ROLE OF RESPONSE ACTION

The scope of the proposed response action shall address the contamination remaining at the site subsequent to the aforementioned removal action. The contamination consists of PCB-contaminated stream sediment, surface and sub-surface soils, buildings and building floor slabs.

The remedy to be selected for the Rose site will address all the identified significant concerns at the site. The final remedy will address the entire site with regard to the principal threats to human health and the environment posed by the release or threat of release of hazardous substances as indicated in the endangerment assessment (EA) performed for the site. This response action will remove all sediment, surface and subsurface soils and structures which represent unacceptable health risks. All non-metallic contaminated material will be landfilled in a Toxic Substance Control Act (TSCA) approved landfill or incinerated in an approved incinerator. Metallic contaminated material will be decontaminated and disposed by conventional means or disposed in a TSCA approved chemical waste landfill. The findings of the EA are included in the RI Report and are summarized in the next section.

SECTION 4: SUMMARY OF SITE RISK

During the RI/FS, an EA was conducted by the Steering Committee and reviewed by EPA to investigate the health and environmental problems that could result if the contamination at the Rose site is not cleaned up. This analysis is commonly referred to as a baseline risk assessment. Forty-four chemicals were identified in the various media at the site. Eleven indicator chemicals were selected based on frequency of detection, concentration, toxicity, mobility, and persistence. They are: PCB Aroclor 1242, PCB Aroclor 1254/1260, 1,1-dichloroethane,1,1-dichloroethene, g-hexachlorocyclohexane (lindane), methylene chloride, tetrachloroethene, toluene, 1,2,4-trichlorobenzene, 1,1,1-trichloroethane, and trichloroethene. These chemicals were found in one or more of the following exposure pathways: the subsurface and surface soils, ground water, sediment, surface water, and on the building surfaces.

The analysis focused on the major contaminant of concern, PCBs. The EA demonstrated that the threats at the Rose site were due primarily to exposure to PCBs. The analysis was conducted for both carcinogenic and non-carcinogenic risks. The excess cancer risks are determined by multiplying the intake level with the cancer potency factor (CPF). The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300, states "For known or suspected carcinogens, acceptable exposure levels are generally concentration levels which represent an excess upper bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6} using information on the relationship between dose and response. The 10^{-6} risk level shall be used as the point of departure for determining remediation goals..." An excess cancer risk of 1×10^{-6} indicates that an individual has a one in a one million chance of developing cancer as a result of reoccurring site related exposure (A risk of 1×10^{-5} would indicate a one in one hundred-thousand risk). See Table I, attached, for a summary of the upper-bound lifetime cancer risks which exceed 1×10^{-6}. The potential for adverse non-carcinogenic effects are derived by calculating the maximum daily dose (MDD)/reference dose (RfD) ratio. A ratio greater than one suggests that the exposure levels exceeds the protective level for that particular chemical. If the hazard quotient for individual chemicals are less than 1.0 but the sum of the hazard quotients for all substances in an exposure medium (ie., the hazard index) is greater than 1.0, then there may be concern for potential health effects, although there is no sharp demarcation between safe and unsafe. (See Table II, attached)

An evaluation requested by EPA in addition to the evaluation made in the Remedial Investigation of the risk presented by the ground water pathway has been made. This evaluation assumed a residential setting and further assumed sufficient surficial ground water (also referred to as the shallow ground water) availability to provide for residential use. Given site conditions, the availability of water from the surficial ground water would not provide an adequate supply for residential use. Assuming that sufficient ground water was available, the cancer risk associated with the ingestion of the shallow ground water at the site is in the 10^{-2} range. This would be unacceptable and, in fact, represents by far the greatest risk at the site, if it could be reasonably expected that ingestion of the surficial ground water would occur. EPA believes, and the state agrees, that the shallow ground water at the site is not a "usable aquifer". Therefore the surficial ground water path is considered incomplete and no actual risk can be expected. The ground water path is considered incomplete for the following reasons:

1. The total ground water flow for the surficial ground water from the entire facility property has been estimated to be 360 gallons per day. Based upon the characteristics of the soil overburden presented in the Remedial Investigation, even a ten-foot diameter well placed in the stratum of concern will have a yield of less than 0.3 gallons per minute over a one-hour pumping period.

2. No known currently used drinking water wells exist in the shallow ground water affected by on site sources of contamination. There are existing wells in the area but are not currently in use due to the low yield of the ground water. It has been reported that some of these wells are being plugged by their owners.

3. The primary concern for the completion of the ground water ingestion path would be the construction of new wells in the surficial ground water. The low volume of ground water and the availability of public water supplies make construction of new drinking water wells in the surficial ground water unrealistic. In addition, Missouri regulations in 10 CSR 23-3.090 (Missouri Private Well Construction Standards - Rules and Organizational Structure for RSMO 256.600, Missouri Department of Natural Resources (DNR), September, 1987) require that private wells have a minimum total casing depth of 40 feet with a minimum of 15 feet of casing penetrating into bedrock. This regulation effectively prohibits the development of drinking water wells in the surficial ground water, since that ground water is found at a depth of no greater than 13.5 feet below the ground surface.

The ground water flow in the lower unit is less than that in the surficial unit, estimated to be 1.2 gallons per day with an average linear ground water velocity of 0.03 feet per year. The hydraulic conductivity is approximately 10^{-6} cm/sec, nearly a magnitude less than the surficial unit. The two units are separated by a semi-confining layer with a hydraulic conductivity of approximately 10^{-7} cm/sec. The possibility for the surficial ground water to percolate through the semi-confining layer exists, but it is believed that this could occur only after a very long time due to the low hydraulic conductivity of that layer. Therefore, based on the above, further consideration of risk from ingestion of ground water will not be considered.

The highest risk, both cancer and non-cancer, from the site would result from occupational exposures to the existing buildings and from regular human consumption of beef fed and watered onsite. Three scenarios were analyzed in the EA to determine the health risks to potential receptors: no action, future industrial development, and future residential development. The analysis is based upon PCB exposure. The results are summarized below:

•No Action

--Onsite cancer risks to the trespasser pose an unacceptable risk ($>10^{-6}$) for dermal contact with the existing building floors and indoor vapor inhalation in the existing buildings. Unacceptable non-carcinogenic effects result from the same pathways.

--Cancer risks to the offsite resident pose an unacceptable risk for ingestion of vegetables and beef grown onsite, dermal contact with sediment, and outdoor vapor inhalation. Unacceptable non-carcinogenic effects are limited to beef ingestion.

•Industrial Development

--Cancer risks to the future onsite industrial worker pose an unacceptable risk for dermal contact with the existing building floors and walls, and for indoor vapor inhalation (existing buildings). The unacceptable non-carcinogenic effects result from dermal contact with the existing building floors and for indoor vapor inhalation (existing buildings).

•Residential Development

--Cancer risks pose an unacceptable risk to the future onsite resident for vegetable ingestion, dermal contact with sediment, indoor vapor inhalation (new building), and child soil ingestion. The unacceptable non-carcinogenic risks result from indoor vapor inhalation.

If no action is taken at the site, an offsite, nearby resident may be subject to an excess lifetime cancer risk of greater than 10^{-4}. This means that if no cleanup action is taken and no changes occur in the current site conditions, more than one additional person in every ten thousand has a chance of contracting cancer as a result of beef raised onsite or occupational use of the onsite buildings. Values for other pathways and scenarios are given in the RI and FS Reports.

Based upon current information, the ground water and surface waters pose no unacceptable risks or health hazards. Evaluation of the ground water at the site reveals two ground water units. These units are referred to as the surficial (or shallow) ground water and the deep ground water. The two units are separated by material that is highly resistant to the downward migration of water. No verifiable evidence of contamination from the site has been found in the deep ground water. A total of four ground water sampling rounds have been completed. Concerns over the unexpected presence of contaminants in the deep ground water in sampling round one and two led to additional precautions being taken during round three. Analysis of samples from the deep ground water in round three displayed a significant reduction of the incidence of contamination. None of the filtered samples from the deep ground water were found to be contaminated. Three of the unfiltered samples were found to contain VOCs. This further confirmed the belief that the samples were being contaminated with surface dust. A fourth round of sampling was undertaken using extreme precautions to prevent contamination from surface dust. No contamination was found in the samples taken from the lower ground water during round four, in either the filtered or unfiltered samples. This led to a confirmation that the positive results in the earlier sampling rounds were the result of cross contamination. There is evidence of contamination of the surficial unit. This contamination is not considered to present any risk for the reasons previously discussed. Finally, if contaminants in the surficial ground water do reach the creek the level and quantity of contamination would not be expected to result in adverse health effects. The presence of contamination in the sediment in the creek and unnamed tributary is considered to represent a health threat. All of the cleanup alternatives call for the removal of the creek and tributary sediment that are contaminated at levels which may result in unacceptable health risks. In addition, all of the cleanup alternatives call for ground water monitoring for 10 years to ensure that no further degradation of either the upper or the lower ground water units occurs. If surface waters are involved in response activities, any water discharged to area surface waters will meet applicable National Pollution Discharge Elimination System (NPDES) discharge limitations.

The RI report identifies no threatened, endangered or rare species in the vicinity of the site. Therefore, no critical habitats appear to be affected by the site contamination.

Actual or threatened releases of hazardous substances from this site, if not addressed by the preferred alternative or one of the other active measures considered, may present a current or potential threat to public health, welfare or the environment.

The remediation goals are to clean up the site to meet acceptable health risk levels ($<10^{-6}$) established by the NCP.

SECTION 5: SUMMARY OF ALTERNATIVES

The alternatives analyzed in the FS to remediate the Rose site are listed below. They are numbered to correspond with the numbers presented in the FS Reports. The alternatives are as follows:

•**Alternative 1:** No Action.

•**Alternative 2:** Remove PCB Sediments; Cap Site Soils.

•**Alternatives 3A & 3B:** Remove PCB Sediments; Cap or Remove Site Soils; Decontaminate Buildings and Concrete.

•**Alternative 4:** Remove PCB Sediments; Cap Site Soils and Concrete; Remove Buildings.

•**Alternatives 5A & 5B:** Remove PCB Sediments; Cap or Remove Site Soils; Decontaminate Buildings and Remove Concrete.

•**Alternative 6:** Remove PCB Sediments; Remove Site Soils, Buildings, and Concrete.

Common Elements

Except for Alternative 1, all of the alternatives considered for the site in the FS Report include a number of common elements. The common elements include institutional controls, sediment removal, site soils removal or capping, final disposal of PCB materials, and ground water monitoring. A description of each common element is presented below.

A) Institutional Controls.

Institutional controls used in the alternatives include legal restrictions on excavation, future use of the buildings, future construction methods, and development of wells on the site.

B) PCB Sediment Removal.

Excavation of sediment with PCB concentrations exceeding 0.18 mg/kg from East Pin Oak Creek and the unnamed tributary is included in Alternatives 2 through 6. Approximately 826 cubic yards of sediment would be removed using standard construction techniques and equipment. Sand and gravel will be used to return the stream bed to grade. Since all sediment will be removed this will also address any potential VOC contamination of sediment.

C) Site Soils Capping or Removal.

Alternatives 2 to 6 involve either the installation of a RCRA type cap or removal of site soils with PCB concentrations at or exceeding 10 mg/kg. A RCRA cap is a man-made barrier which incorporates a man-made sheeting, layers of impervious clays, layers of soil and erosion protection at the surface.

Alternatives 2, 3A, 4, and 5A call for capping of the site soils. The areas to be capped range from exterior soils in Alternatives 2, 3A, and 5A, to exterior soils and the concrete slabs in Alternative 4. Removal of the site soils is included in Alternatives 3B, 5B, and 6. Alternative 3B calls for removal of approximately 3,276 cubic yards of exterior site soils. Alternatives 5B and 6 would include removal of approximately 4,031 cubic yards of exterior site soils and soils beneath the concrete slabs. In all alternatives that include removal of soil, a minimum ten inch cover of clean soil (containing less than 1 ppm PCBs) will be placed over the excavated area.

D) Final Disposal Options for Removed Materials.

Three final disposal options for the removed solids and semi-solids containing PCBs (sediments, excavated soils, building materials, concrete, and spent activated carbon used during cleanup) were evaluated under each alternative. They are: (1) offsite landfilling; (2) offsite incineration; and (3) onsite incineration. The landfills or incinerators to be used will meet the specific requirements of the Toxic Substance Control Act (TSCA) Regulations at 40 C.F.R. Part 761. None of the alternatives involve onsite landfilling of contaminated material. RCRA's land disposal criteria in 40 C.F.R. Part 268 prohibits the placement of any RCRA waste with a total halogenated organic carbon (HOC) concentration of 1,000 ppm or greater in a landfill. All material to be landfilled will be evaluated to determine if it is a RCRA waste subject to the land disposal restrictions. Additional sampling will be done if necessary. If the material is determined to be a RCRA waste, it will be treated if the total HOCs exceed 1,000 ppm. It is not anticipated that any material from the site will be determined to be a RCRA waste.

Water removed from onsite ponds and dewatered sediments would be treated onsite using activated carbon. The treated water could then potentially be discharged to the unnamed tributary onsite, land-applied onsite, or discharged to the Holden Publicly Owned Treatment Works (POTW).

E) Ground Water Monitoring.

Under all alternatives, yearly, or more frequent, ground water sampling for PCBs, VOCs, and metals would be conducted for 10 years. Although not specifically stated in the FS, it is expected that additional wells would be constructed in order to develop an adequate ground water monitoring plan. Ground water monitoring will be designed to allow any changes in the conditions of the ground water to be fully monitored.

Alternative 1: No Action

In this alternative, the site would not be available for use and would be considered a "no access" area because the PCB contaminated material at the site would be left in its present state.

The Superfund program requires that the no action alternative be evaluated at every site to establish a base line for comparison. Under this alternative the site would be left in its current state and institutional controls would be implemented. The site perimeter fence would be expanded to enclose the portion of the unnamed tributary to East Pin Oak Creek that transects the southwestern portion of the Rose property. Signs would be placed to warn potential trespassers of site dangers. A deed restriction would be placed on the property deed to prohibit use of the site for all purposes. This alternative would not satisfy potential chemical-specific requirements of the PCB Spill Cleanup Policy which sets exposure limits at 10 milligrams per kilogram (mg/kg) in soil and 10 micrograms (μg) per 100 square centimeters (cm^2) for surfaces for residential scenarios.

Capital Cost: $22,000
Annual Operation and Maintenance (O&M) Costs: $3,200
Present Worth (PW): $71,000
Months to Implement:60 days

Alternative 2: Remove Stream PCB Sediments; Cap Site

Under this alternative, the site would not be available for use and would be considered a "no access" area because the majority of the contaminated material at the site would be left in its present state.

This alternative consists of: (1) removal of sediments containing PCBs from the East Pin Oak Creek and the unnamed tributary as previously discussed; (2) pumping and treatment of an estimated 545,000 gallons of water from onsite storage ponds; (3) installation of a multimedia cap over 70,960 square feet of site soils and pond sediments which contain PCBs at or greater than 10 mg/kg; (4) removal of 1,090 cubic yards of soil and sediments containing PCBs at or greater than 10 mg/kg from site areas which cannot be practically capped (adjacent to site buildings, property lines, or on a drainage way); (5) institutional controls, including closing and fencing of the site buildings, and a deed restriction to prohibit use of the site; and (6) yearly ground water monitoring for 10 years.

Offsite Landfill Disposal Option

Capital Cost: $3,290,000
Annual O&M: $39,000
PW: $3,670,000
Months to Implement: 8 months

Offsite Incineration Disposal Option

Capital Cost: $9,730,000
Annual O&M: $39,000
PW: $10,110,000
Months to Implement: 38 months

Onsite Incineration Disposal Option

Capital Cost: $6,540,000
Annual O&M: $39,000
PW: $6,920,000
Months to Implement: 30 months

Alternatives 3A & 3B: Remove PCB Sediments; Cap (3A) or Remove (3B) Site Soils; Decontaminate Buildings and Concrete

Alternative 3 has been developed to allow the site to be used in the industrial development scenario. Alternatives 3A and 3B both involve removal of sediments from the East Pin Oak Creek and the unnamed tributary as previously discussed. Both alternatives also include decontamination of the building skin, structural members, and concrete by various decontamination methods. It is estimated that, under these alternatives, 12 tons of insulation would be removed from the site building for disposal; 160,000 square feet of building skin and structural members would be cleaned; and, 303 cubic yards of concrete would be completely removed. Both alternatives use institutional controls to restrict future site use to industrial purposes only. Ground water monitoring is included in both alternatives.

Alternative 3A includes installation of a RCRA type cap over 70,960 square feet of site soils (including containment pond sediments) containing PCBs at or greater than 10 mg/kg. Removal of 1,090 cubic yards of soil and sediments in areas where capping is not practical (for example, next to buildings or adjoining property) would be required. Alternative 3B includes excavation of 2,934 cubic yards of soil, containing PCBs at or greater than 10 mg/kg, and backfilling of the excavated areas with a clean soil cover. The FS states that compliance with applicable or relevant and appropriate requirements (ARARs) is met under both alternatives (3A and 3B). The FS states that the PCB Spill Cleanup Policy for exposure to PCB soils and buildings is met by applying a RCRA type cap to or removing soils with PCBs at or greater than 10 mg/kg and decontaminating building surfaces to concentrations of less than 10 $\mu g/100$ cm.

<u>3A - Capping</u>

Offsite Landfill Disposal Option

Capital Cost: $6,870,000
Annual O&M: $38,400
PW: $7,240,000
Months to Implement: 11 months

<u>3B - Removal</u>

Offsite Landfill Disposal Option

Capital Cost: $9,040,000
Annual O&M: $31,900
PW: $9,310,000
Months to Implement: 10 months

3A - Capping(cont.)

Offsite Incineration Disposal Option

Capital Cost: $14,450,000
Annual O&M: $38,400
PW: $14,820,000
Months to Implement: 45 months

Onsite Incineration Disposal Option

Capital Cost: $10,610,000
Annual O&M: $38,400
PW: $10,980,000
Months to Implement: 30 months

3B - Removal(cont.)

Offsite Incineration Disposal Option

Capital Cost: $22,570,000
Annual O&M: $31,900
PW: $22,840,000
Months to Implement: 83 months

Onsite Incineration Disposal Option

Capital Cost: $15,840,000
Annual O&M: $31,900
PW: $16,110,000
Months to Implement: 33 months

Alternative 4: Remove PCB Sediments; Cap Site Soils and Concrete; Remove Buildings

Under this alternative, limited portions of the site would be available for future light industrial use. Institutional controls would prevent any use which would involve the breaching or threatening of the integrity of the cap. No residential structures would be allowed.

This alternative is similar to Alternative 3. However, instead of attempting to decontaminate the buildings, such structures would be removed using conventional demolition techniques. It is estimated that 558 tons of building materials would be removed and disposed. The area of the site capped by the RCRA type cap described in Alternative 3 would be expanded to include concrete slabs. This area is estimated to be 275,000 square feet. The FS indicates this alternative meets the same potential ARARs as Alternative 3.

Offsite Landfill Disposal Option

Capital Cost: $5,680,000
Annual O&M: $44,800
PW: $6,150,000
Months to Implement: 17 months

Offsite Incineration Disposal Option

Capital Cost: $13,970,000
Annual O&M: $44,800
PW: $14,440,000
Months to Implement: 54 months

Onsite Incineration Disposal Option

Capital Cost: $10,030,000
Annual O&M: $44,800
PW: $10,500,000
Months to Implement: 31 months

Alternatives 5A & 5B: Remove PCB Sediments; Cap or Remove Site Soils; Decontaminate Buildings; Remove Concrete

Alternatives 5A and 5B use the same technologies as Alternatives 3A and 3B with the exception that these alternatives include removal of the major portions of the concrete slabs and treatment of the remaining portions left onsite. The concrete slabs would be removed by conventional demolition techniques. The building skin and structural members would remain intact and would be cleaned by chemical and physical means as in Alternatives 3A and 3B. As discussed previously, PCB soils (equal to or greater than 10 mg/kg) would be capped under Alternative 5A, while under Alternative 5B, they would be removed and the excavated area covered with a minimum of ten inches of clean soil. The institutional controls for this Alternative would prohibit the construction of residential structures or the use of the site for anything but industrial purposes.

After removal of the concrete slab, the soil beneath the slab would be tested for PCB contamination. Any soil found to contain PCBs at concentrations equal to or greater than 10 mg/kg would be removed and covered with a minimum of ten inches of clean soil.

It is estimated that 960 cubic yards of this soil would need to be excavated and disposed. The FS indicates this alternative meets the same ARARs as Alternative 3.

<u>5A - Capping</u>

Offsite Landfill Disposal

Capital Cost: $8,480,000
Annual O&M: $38,400
PW: $8,850,000
Months to Implement: 16 months

Offsite Incineration Disposal Option

Capital Cost: $23,090,000
Annual O&M: $38,400
PW: $23,460,000
Months to Implement: 91 months

<u>5B - Removal</u>

Offsite Landfill Disposal Option

Capital Cost: $12,970,000
Annual O&M: $31,900
PW: $39,790,000
Months to Implement: 14 months

Offsite Incineration Disposal Option

Capital Cost: $39,520,000
Annual O&M: $31,900
PW: $39,790,000
Months to Implement: 148 months

5A - Capping (cont.)

Onsite Incineration Disposal Option

Capital Cost: $15,330,000
Annual O&M: $38,400
PW: $15,700,000
Months to Implement: 34 months

5B - Removal (cont.)

Onsite Incineration Disposal Option

Capital Cost: $26,100,000
Annual O&M: $31,900
PW: $26,370,000
Months to Implement: 40 months

Alternative 6: Remove PCB Sediments; Remove Site Soils, Buildings, and Concrete

This alternative is designed to allow future use of the site with the fewest restrictions of any alternative described in the FS. This alternative would consist of removing the PCB soils, sediments, and building materials (including the concrete slabs) from the site and placing a 10-inch-thick soil cover over the eastern portion of the site. Alternative 6 uses technologies similar to those used in the previous alternatives. However, two additional technologies would be used to achieve PCB cleanup criteria for surface and subsurface soils. After PCB soils are removed from the site, a 10-inch-thick (minimum) layer of clean soil would be applied to the eastern side of the site. It is estimated that 14,250 tons of sediment, soils, concrete, and building materials would be removed from the site under this alternative. The FS indicates that this alternative meets all ARARs.

Offsite LANDFILL DISPOSAL OPTION

Capital Cost: $12,360,000
Annual O&M: $30,500
PW: $12,665,000
Months to Implement: 12 months

Offsite Incineration Disposal Option

Capital Cost: $41,510,000
Annual O&M: $30,500
PW: $41,760,000
Months to Implement: 154 months

Onsite Incineration Disposal Option

Capital Cost: $25,550,000
Annual O&M: $30,500
PW: $25,800,000
Months to Implement: 41 months

SECTION 6: DESCRIPTION OF PREFERRED REMEDY

Upon review of the alternatives in the feasibility study (FS), EPA has determined that Alternative 6 is the preferred remedy. However, there is concern with the selection of a PCB disposal method. In August of 1990, the Agency published guidance on handling PCB contamination at Superfund sites, stating that treatment should be considered for soil and debris contaminated with PCBs exceeding 100 ppm. The guidance does not directly address the disposal of PCB-contaminated concrete. Other guidance has made specific reference to concrete and recognized the technical difficulties encountered when attempting to deal with the treatment and disposal of contaminated concrete.

In evaluating the statutory preference for treatment in order to achieve permanence, the Region was unable to identify the existence of like situations from which to draw assistance. However, the stasticial approach used at the New Bedford Harbor Site in Region I lead to a similar approach being applied at the Rose site to determine an appropriate cost effective level of treatment for contaminated concrete.

The EPA estimated the cost of landfilling all materials at the Rose site at $12,400,000. That cost will be used as a base cost for comparison.

- A 5% increase in the base cost to $13,000,000 will allow treatment of all concrete greater than 10,000 ppm and soils significantly greater than 100 ppm. This will treat 58% of the PCBs contained in the concrete at the site.

- An 10% increase in the base cost to $13,600,000 will allow treatment of all concrete greater than 2,500 ppm and soils significantly greater than 100 ppm. This will treat 81% of the PCBs contained in the concrete.

- A 22.4% increase in the base cost to $14,800,000 will allow the treatment of all concrete contaminated at levels greater than 1,000 ppm and soils contaminated significantly greater than 100 ppm. This will treat 94.5% of the PCBs contained in the concrete at the site.

- A 24% increase in the base cost to $15,400,000 will allow the treatment of all concrete contaminated at levels greater than 500 ppm and soils contaminated significantly greater than 100 ppm. This will treat 97.7% of the PCBs contained in the concrete at the site.

- In order to treat all concrete which exceeds 100 ppm over 27% increase in the base cost to $15,800,000 would be required. This would treat 99.7% of the PCBs contained in the concrete at the site as well as the soils contaminated at levels significantly greater than 100 ppm.

Analysis of the above, along with the nine criteria set forth in 40 C.F.R. § 300.430(f) and consideration of the statutory preference for treatment in order to achieve permanence, has resulted in the selection of a disposal option in which all concrete contaminated at levels equal to or greater than 2,500 ppm and all soil contaminated at levels significantly greater than 100 ppm will be incinerated.[1] Materials falling below these thresholds will be disposed in an appropriate TSCA chemical waste landfill.

The preferred remedy includes the items listed below. Note that prior to the disposal of any contaminated material, a determination will have to be made as to the applicability of the RCRA land disposal restrictions in 40 C.F.R. Part 268.

- Excavation and landfilling of tributary and stream sediments containing PCBs equal to or greater than 0.18 ppm. It is not anticipated that any sediment will exceed 100 ppm. If it does, it will be treated as soil.

- Excavation and landfilling of onsite soils containing PCBs at levels between 10 and approximately 100 ppm.

- Excavation and incineration of PCBs contaminating soils significantly in excess of 100 ppm.

- Dismantling and landfilling building structure, including floor slab and the insulation which can be demonstrated to be contaminated with less than 2,500 ppm PCBs.

- Incineration of PCBs contaminating building structure components in excess of 2,500 ppm PCBs.

- Backfill the excavated areas with clean soil and bring to grade; at a minimum, a 10-inch thick layer of clean material will be placed over all excavated areas.

- Ground water monitoring for a 10-year period.

- Deed restrictions prohibiting residential structures and wells in the shallow ground water.

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1. Other forms of treatment may be considered if they can be proven to provide equivalent protection. This note may be applied to the term incineration throughout the remainder of this document.

A) STREAM SEDIMENT

All stream sediment contaminated at levels equal to or greater than 0.18 ppm is to be removed and disposed in an approved TSCA chemical waste landfill.

Once verification sampling confirms that all sediment equal to or greater than 0.18 ppm has been removed, the excavated portion of the stream beds will be backfilled with sand and gravel to restore the stream to the pre-excavation condition.

B) SOIL

All soil greater than or equal to 10 ppm will be removed from the site. The contaminated soil with PCB contamination between 10 and approximately 100 ppm will be disposed in an approved TSCA chemical waste landfill. PCBs contaminating soil significantly in excess of 100 ppm will be incinerated.

All areas from which soil is excavated will be covered with at least ten inches of clean fill (soil containing less than 1 ppm PCBs). The entire eastern portion of the site is to be covered with at least ten inches of clean fill.

C) BUILDING STRUCTURE

The building will be dismantled and all metal components and interior partitions will be removed. All of the above contaminated materials will be either disposed of in an approved TSCA chemical waste landfill or decontaminated and sold for scrap. It is not anticipated that any of the metal components will be contaminated at levels which exceed 100 ppm. Any material not sent to an approved TSCA chemical waste landfill will be sampled to verify that it is not contaminated prior to disposal. The residues of any decontamination process will be disposed of in a manner approved specifically by EPA in accordance with applicable law.

D) CONCRETE SLABS

The concrete slabs supporting the two buildings have been found to be contaminated with PCBs. The concrete slabs will be removed in their entirety and concrete contaminated at levels between 10 and 2,500 ppm will be disposed of in an approved TSCA chemical waste landfill. PCBs contaminating concrete in excess of 2,500 ppm will be incinerated.

E) GROUND WATER

A ground water monitoring program would be designed and implemented for the site. A ten year period will be the base period for which the monitoring plan will be designed. The ground water monitoring plan will be designed specifically for the site with the intent to monitor for any change in the quality of the ground water in the vicinity of the site.

The ground water monitoring plan will include provisions to deal with unexpected contingencies. The major contingency which can be anticipated, although not expected, is that future monitoring will reveal changes in the condition of the ground water necessitating additional response actions. Specific actions appropriate to changed conditions will be incorporated in the ground water monitoring plan. Specific references to actions necessary to respond to conditions which will require stream sediment surface water sampling will be included.

COST AND TIME ESTIMATE

An independent survey of costs taken by the Agency at a later time than the estimates in the FS resulted in some cost and time estimates being at variance with those in the FS for some venders, although the costs quoted were representative of other venders. Although there are a number of variables which will influence both the cost and time to implement the preferred remedy, EPA estimates it will cost $13,600,000 and, except for ground water monitoring, take approximately 15 months to complete once work begins. Appendix A contains the general results of the cost analysis for the various disposal options for Alternative 6.

SECTION 7: EVALUATION OF ALTERNATIVES

A) EVALUATION CRITERIA

This section profiles the performance of the preferred alternatives against the nine criteria that the USEPA uses to evaluate alternatives, noting how it compares to the other options under consideration. The nine criteria are divided into three groups: threshold, balancing and modifying. Definitions of the evaluation criteria and the groups they fall in are given below.

THRESHOLD

·Overall protection of human health and environment

Addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

·Compliance with ARARs

Addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements (ARARs) of federal and state environmental statutes and/or provide grounds for invoking a waiver.

BALANCING

•Long-term effectiveness and permanence

This criteria relates to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

•Reduction of toxicity, mobility, or volume through treatment

This criteria relates to the anticipated performance of the treatment technologies that may be employed in a remedy.

•Short-term effectiveness

This criteria relates to the speed with which the remedy achieves protection, as well as the remedy's potential for adverse impacts on human health and the environment that may come about during the construction and implementation period.

•Implementability

This criteria relates to the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

•Cost

Calculation of cost includes capital and operation and maintenance costs.

MODIFYING

•State acceptance

Indicates whether the State, based on its review of the RI and FS Reports and Proposed Plan, concurs with, opposes, or has no comment on the preferred remedy.

•Community acceptance

Will be assessed in the Record of Decision following a review of the public comments received on the RI and FS Reports and the Proposed Plan.

B) ANALYSIS

1) Overall Protection of Human Health and Environment.

All of the alternatives, with the exception of the no action alternative, would provide protection of human health and the environment by eliminating, reducing, or controlling risk through treatment, engineering controls, or institutional controls. The preferred remedy provides the greatest overall protection by removing PCB materials from the site, thus reducing the risks associated with direct contact. Because the no action alternative is not protective of human health and the environment, it is not considered further in this analysis as an option for this site.

2) Compliance with ARARs

The preferred remedy will meet applicable or relevant and appropriate requirements of Federal and State environmental laws. Location-specific ARARs were identified for the small flood plain portion of the site and will not affect the remedy. With respect to cleanup levels for the alternatives that involve the excavation and disposal of PCB-contaminated soils, the preferred remedy and the other alternatives are based upon the standards established in the PCB Spill Clean-up Policy, Subpart G of 40 C.F.R. Part 761.

All alternatives involve the removal and disposal of PCB-contaminated sediments from site tributaries and creeks. The FS states that site surface waters are not classified by Missouri Department of Natural Resources (MDNR), and therefore the Missouri Water Quality Standards are not applicable to the response actions described in the alternatives. The State does have standards which address unclassified streams and beef cattle. All alternatives address this concern. The State of Missouri has not, at this time, taken exception to the identification of ARARs as presented in the FS. The State has identified potential site specific ARARs for the site (See Appendix B).

Alternatives 2, 3A, 3B, 4, 5A, 5B and 6, identify onsite incineration as a potential disposal option. The PCB regulations at 40 C.F.R. Part 761 would be an ARAR, as would Subpart O (incinerators) of 40 C.F.R. Part 264 of the hazardous waste regulations, if any materials to be incinerated were determined to be a hazardous waste.

Alternative 2, 3A, 4 and 5A would involve the installation of a RCRA type cap over portions of the site. Closure and post-closure requirements of the hazardous waste regulations in 40 C.F.R. Part 264 may be applicable or relevant and appropriate. For site capping, a TSCA waiver is required from the Regional Administrator. A waiver would only be issued if it is demonstrated that waiving a substantive requirement will not present an unreasonable risk of injury to health or the environment.

APPLICABLE ARARS

The following ARARs are considered applicable or relevant and appropriate for some or all of the alternatives for remedial alternatives at the Rose site.

* TOXIC SUBSTANCES CONTROL ACT
* CLEAN AIR ACT
* CLEAN WATER ACT
* RESOURCE CONSERVATION AND RECOVERY ACT
* HAZARDOUS MATERIAL TRANSPORTATION ACT
* SOLID WASTE DISPOSAL ACT
* OCCUPATIONAL SAFETY AND HEALTH ACT
* FLOOD PLAIN MANAGEMENT
* MISSOURI HAZARDOUS WASTE MANAGEMENT LAW
* STATE SOLID WASTE MANAGEMENT LAWS
* MISSOURI AIR CONSERVATION ACT
* MISSOURI SAFE DRINKING WATER ACT

ARARs TO BE INVESTIGATED

The following ARARs may be applicable or relevant and appropriate and further investigation during the design phase of selected remedial alternative will be necessary to determine the applicability or relevance and appropriateness.

* PROTECTION OF WETLANDS
* FISH AND WILDLIFE COORDINATION ACT

3) Long-Term Effectiveness and Permanence

The preferred remedy would provide long-term effectiveness and permanence at the site by removing most of the contaminated materials from the site. PCB soils of less than 10 ppm would remain at the site; however all excavated areas would be covered with a minimum of ten inches of clean soil to provide additional protection for human health and the environment. Alternative 4 provides long-term effectiveness and permanence by controlling exposure to PCBs through removal of the above grade structures and capping of the onsite soils and exposed concrete slabs. The permanence of this alternative is dependent upon the maintenance of the cap and therefore offers less certainty with regard to permanence than the actions specified in the preferred remedy. Alternatives 3 and 5 would allow future industrial use, but deed restrictions would be required because some materials containing PCBs remain on the site. There are more uncertainties with respect to long-term effectiveness and permanence associated with the decontamination and encapsulation technologies used in Alternatives 3 and 5 to clean the buildings and encapsulate the concrete. Alternative 3 is similar to Alternative 5 in that both involve capping or removal of site soils and decontamination of the buildings. Implementation of Alternative 3 would clean the building and decontaminate and encapsulate the concrete. Implementation of Alternative 5 would clean the buildings and remove the concrete. Action under Alternative 3 would have less long-term effectiveness than Alternative 5. Under Alternative 5B, PCB soils equal to or greater than 10 mg/kg total PCBs would be removed; under Alternative 5A the PCB soils (equal to or greater than 10 mg/kg) would be capped. Implementation of Alternative 5B would have greater long-term effectiveness than Alternative 5A, because PCB soils would be removed from the site. Action under Alternative 2 would allow no future access or use of the site because this alternative would leave the most PCB materials (soils and buildings) onsite and therefore offers less long-term effectiveness or permanence than the other alternatives.

4) Reduction of Toxicity, Mobility, of Volume through Treatment

All of the alternatives (except Alternative 1) provide some level of treatment for the contamination. All alternatives treat surface water generated during sediment removal or from onsite ponds. This treatment does not constitute significant treatment of contaminants from the site. Only the alternatives which utilize incineration provide any actual treatment. Incineration will result in a reduction of toxicity, volume and mobility. The use of offsite chemical waste landfills will not reduce the toxicity or the volume but should reduce the mobility of the contaminating PCBs. All of the alternatives also provide the option of disposing of the removed solids and semi-solids by direct offsite landfilling or by off or onsite incineration. Alternative 2 provides the least reduction. The preferred remedy would provide reduction of mobility through placing some contaminated material in a TSCA chemical waste landfill and permanence through destruction of PCBs by incineration.

5) Short-term effectiveness

The short-term effectiveness of an alternative is dependent on the level of onsite construction activities and the chosen disposal option. In general, an alternative with the offsite landfill disposal option would have greater short-term effectiveness than an alternative with onsite incineration. In turn, an alternative with the offsite incineration disposal option could have the least short-term effectiveness, depending upon long-term onsite storage of the contaminated material which could be required if offsite incinerator capacities are not sufficient to treat the material from the site as they are excavated. Alternative 2 affords the greatest short-term effectiveness with regard to onsite excavation activities; the FS estimates it to take 10 months to complete. Alternative 6, using the offsite incineration disposal option, affords the least short-term effectiveness; while the FS estimates it to take 154 months to complete, EPA estimates for the preferred remedy involving both offsite incineration and offsite landfilling is 15 months. Alternative 6, using the offsite landfill disposal option, is estimated to take 12 months. Therefore, Alternative 2 with the offsite landfill disposal option affords the greatest short-term effectiveness, and Alternative 6 with the offsite incineration disposal option, restricted to the single company included in the FS estimates, the least. The estimated time frames as presented in the FS for implementing each alternative are described in Sections 5 and 6 of this Proposed Plan.

6) Implementability.

All alternatives (except Alternative 1) use conventional excavation equipment. The capping required in Alternatives 3A, 4, and 5A is not difficult to implement but would require more specialized workers and equipment than the excavation techniques included in the other alternatives. The decontamination and encapsulation technologies used in Alternatives 3 and 5 also require specialized equipment and personnel. The building decontamination and soil testing and removal processes are iterative in nature. For example, after cleaning the building once, testing would be performed to determine if the cleanup standards had been met. If they had not, additional cleaning would be required. This could cause schedule delays.

Mobile incinerators are available, but they require specialized equipment and operators. The activated carbon water treatment units are readily available. Several offsite incinerators are commercially available for the site. There may be a backlog of materials at the offsite incinerators, which could cause a delay in the removal of materials. Offsite landfills for PCBs are available and represent a conventional means of disposal of PCB-contaminated material. Transportation of the material would be required. Also, stabilization of the sediments prior to transportation and landfilling would be required. Long-term monitoring would be required under all alternatives but would not be difficult to implement.

7) Cost.

The estimated present worth of the preferred remedy is $13,600,000. The lowest cost alternative (besides Alternative 1 - $71,000) is Alternative 2, with the offsite landfill disposal of the sediments and some soils option, at a present worth of $3,670,000. The highest-cost alternative is Alternative 6, with the offsite incineration for disposal of all PCB contaminated material greater than 10 ppm, at a present worth of $41,760,000. Specific cost estimates as presented in the FS for all alternatives are identified in Sections 5 and 6 of this Proposed Plan.

8) State Acceptance

MDNR has made comments on the preferred remedy which have been considered and, where appropriate, incorporated into this document. However, the State has indicated it will reserve final comment on the Proposed Plan until the public comment period has been initiated.

9) Community Acceptance

Community acceptance of the preferred remedy will be evaluated after the public comment period ends and will be described in the Record of Decision (ROD) for the Rose site.

SECTION 8: SUMMARY OF THE PREFERRED REMEDY

In summary, the preferred remedy would substantially reduce health risks at the site by removing those threats presented by PCB contamination at levels equal to or exceeding 10 ppm. Agency guidance defines the principal threat for PCB-contaminated soil as soils contaminated at levels significantly greater than 100 ppm PCBs. The minor amounts of soil at the site that exceed this criteria will be incinerated. Additionally, a portion of the concrete floor slabs are contaminated at levels which are considered a principal threat. Concrete contaminated at levels exceeding 2,500 ppm will be incinerated. Soil contaminated with PCBs from 10 to approximately 100 ppm and concrete contaminated between 10 and 2,500 ppm will be removed from the site and placed in an approved TSCA chemical waste landfill. This alternative achieves risk reduction with less cost than some of the other alternatives and restores the land to a beneficial use. Thus, the preferred remedy is believed to provide the best balance of tradeoffs among alternatives with respect to the evaluation criteria. Based on the information available at this time, the USEPA believes the preferred remedy satisfies the statutory requirement in Section 121(b) of CERCLA that the alternative: be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable and satisfy the statutory preference for treatment as a principal element, or justify not meeting the preference.

SECTION 9: COMMUNITY'S ROLE IN SELECTION PROCESS

The USEPA solicits input from the community on the cleanup methods proposed for the Martha C. Rose Chemicals, Inc. site. The USEPA has set a public comment period from June 20, 1991 through July 21,1991 to encourage public participation in the remedy selection process for the Rose site. Pursuant to Section 117(a) of CERCLA the comment period includes a public meeting at which the USEPA with the MDNR will present the RI and FS Reports and Proposed Plan, answer questions, and accept both oral and written comments.

A public meeting is scheduled for 7:00 P.M. , July 11, 1991 and will be held at the Holden City Offices, in Holden, MO.

Comments will be summarized and responses provided in the Responsiveness Summary attached to the Record of Decision (ROD). The ROD is the document that presents the USEPA's final decision for cleanup. To send written comments or obtain further information, contact:

Rowena L. Michaels

Director, Office of Public Affairs

U.S. Environmental Protection Agency

726 Minnesota Avenue, Kansas City, KS 66101

(913) 551-7003 Toll free 1-800-223-0425

between 8:30 a.m. and 5:00 p.m. CDT (Monday-Friday)

GLOSSARY

Specialized terms used elsewhere in this Proposed Plan are defined below:

activated carbon - Absorbent material used in water treatment to remove organic contaminants.

Applicable or Relevant and Appropriate Requirements (ARARs) - The federal and state requirements that a contaminant concentration or remedy must attain. These requirements may vary between sites and alternatives.

"delisting" - The formal process of declaring a material no longer hazardous following treatment.

encapsulation - Application of an impermeable sealant to immobilize contaminants.

ground water - Underground water that fills pores in soils or openings in rocks to the point of saturation. Unlike surface water, ground water cannot clean itself by exposure to sun or filtration. Ground water is often used as a source of drinking water via municipal or domestic wells.

incineration - High temperature burning of materials to destroy hazardous compounds.

intermittent tributary - Small creek which does not contain water year-round.

polychlorinated biphenyls (PCBs) - Chemicals used for their thermal stability and non-flammability as an electric fluid in electrical capacitors and transformers.

potentially responsible party (PRP) - Defined under Section 107(a) of CERCLA. PRPs include current and past owners and operators, as well as persons who arranged for the transport, treatment, or disposal, of hazardous substances.

present worth - Present worth is the amount of capital required to be deposited at the present time at a given interest rate to yield the total amount necessary to pay for initial construction costs and future expenditures. Present worth analysis provides a method of evaluating and comparing costs that occur over different time periods (such as operation and maintenance) by discounting all future expenditures to the present year.

volatile organic compounds (VOCs) - Organic compounds that vaporize easily. Some VOCs have been shown to cause leukemia, some are toxic to the kidney and liver; and some depress the Central Nervous System, causing drowsiness.

TABLE I

SUMMARY OF UNACCEPTABLE UPPER-BOUND LIFETIME CANCER RISK

PATHWAY	NO ACTION (Current Use)	INDUSTRIAL DEVELOPMENT	RESIDENTIAL DEVELOPMENT
GW INGESTION			1.7×10^{-2}
SOIL INGESTION, (CHILD)			3.7×10^{-6}
WADING, DERMAL	1.0×10^{-6}		
VAPOR INHALATION, OUTDOOR	1.0×10^{-5}		
NEW BUILDING		1.0×10^{-6}	9.0×10^{-6}
+BEEF, INGESTION	1.3×10^{-4}		
VEGETABLE, INGESTION	1.3×10^{-6}		5.5×10^{-6}
SEDIMENT, DERMAL	1.8×10^{-6}		1.8×10^{-6}
EXISTING BUILDING			
VAPOR INHALATION	1.6×10^{-5}	3.8×10^{-3}	
FLOOR, DERMAL	6.0×10^{-5}	1.7×10^{-3}	
WALL, DERMAL	1.7×10^{-6}	4.9×10^{-5}	

TABLE II

UNACCEPTABLE MMD/RfD RATIOS FOR NON-CARCINOGENIC EFFECTS

PATHWAY	NO ACTION (Current Use)	INDUSTRIAL DEVELOPMENT	RESIDENTIAL DEVELOPMENT
VAPOR INHALATION INDOOR, NEW BUILDING			2.0
BEEF INGESTION	1.4		
EXISTING BUILDING			
VAPOR INHALATION	8.8	54	
FLOOR, DERMAL	31	24	
GW INGESTION			37.1

APPENDIX A

COST ESITMATES

INCINERATION DISPOSAL OPTIONS

OFF SITE INCINERATION

SOIL > 100 PPM   CONCRETE > 100 PPM

VOLUME

SOIL

>100 PPM = 227 TONS	13 TRUCKS
>10<100 PPM = 8176 TONS	454 TRUCKS
CONCRETE	
>100 PPM = 3330 TONS	185 TRUCKS
<100 PPM = 1170 TONS	65 TRUCKS

COST ESTIMATE

LANDFILL 110 $/TON (8176 + 1170) = $ 1,028,060

TRANSPORTATION 3.5 (1535) (454 + 65) = $ 2,788,328

INCINERATE 1500 $/TON (227 + 3330) = $ 4,654,500

TRANSPORTATION 3.5 (200) (13 + 185) = $ 138,600

SUBTOTAL......................... $ 8,609,488

TOTAL = 8,609,488 + BASE COST(7,161,919) = $ 15,771,407

$ 15,800,000

OFFSITE INCINERATION

SOIL > 100 PPM   CONCRETE > 500 PPM

I. VOLUMES

SOIL

>100 PPM = 227 TONS	@ 18 TONS / TRUCK	13 TRUCKS
>10<100 PPM = 8176 TONS		454 TRUCKS

CONCRETE

>500 PPM = 2430 TONS	135 TRUCKS
<500 PPM = 2070 TONS	115 TRUCKS

COST ESTIMATE

LANDFILL 110 $/TON (8176 + 2070) = $ 1,127,060

TRANSPORTATION 3.5(1535) (454 + 115) = $ 3,056,953

INCINERATION 1500 $/TON (227 + 2430) = $ 3,985,500

TRANSPORTATION 3.5 (200) (13 + 135) = $ 103,600

SUBTOTAL = ...$ 8,273,113

TOTAL = 8,273,113 + BASE COST (7,161,919) = $ 15,435,032

$15,400,000

OFF SITE INCINERATION

SOIL > 100 PPM CONCRETE > 1000 PPM

VOLUMES

SOIL

>100 PPM = 227 TONS	13 TRUCKS
>10 <100 PPM = 8176 TONS	454 TRUCKS

CONCRETE

> 1000 PPM = 1845 TONS	103 TRUCKS
< 1000 PPM = 2655 TONS	148 TRUCKS

COST ESTIMATE

LANDFILL 110 $/TON (8176 + 2655) = $ 1,191,410

TRANSPORTATION 3.5 (1535) (454 + 148) = $ 3,234,245

INCINERATION 1500 $/TON (227 + 1845) = $ 3,108,000

TRANSPORTATION 3.5 (200) (13 + 103) = $ 88,200

SUBTOTAL.................................$ 7,621,855

TOTAL = 7,621,855 + BASE COST(7,161,919) = $ 14,783,744

$ 14,800,000

OFF SITE INCINERATION

SOIL >100 PPM   CONCRETE >2500 PPM

VOLUME

SOIL

> 100 PPM = 227 TONS	13 TRUCKS
>10 < 100 PPM = 8176 TONS	454 TRUCKS

CONCRETE

>2500 PPM = 810 TONS	45 TRUCKS
<2500 PPM = 3690 TONS	205 TRUCKS

COST ESTIMATE

LANDFILL 110 $/TON (8176 + 3690) = $ 1,305,260

TRANSPORTATION 3.5 (1535) (454+ 205) = $ 3,540,478

INCINERATION 1500 $/TON (227 + 810) = $ 1,555,500

TRANSPORTATION 3.5 (200) (13 + 45) = $ 40,600

SUBTOTAL ....$ 6,441,838

TOTAL = 6,441,838 + BASE COST (7,161,919) = $ 13,603,756

<u>$ 13,600,000</u>

OFF SITE INCINERATION

SOIL > 100 PPM CONCRETE >10,000 PPM

VOLUMES

SOIL

>100 PPM = 227 TONS	13 TRUCKS
>10 < 100 PPM = 8176 TONS	454 TRUCKS

CONCRETE

>10,000 PPM = 315 TONS	18 TRUCKS
<10,000 PPM = 4185 TONS	232 TRUCKS

COST ESTIMATE

LANDFILL 110 \$/TON (8176 + 4185) = \$ 1,359,710

TRANSPORTATION 3.5 (1535) (454 + 232) = \$ 3,685,535

INCINERATION 1500 \$/TON (227 + 315) = \$ 813,000

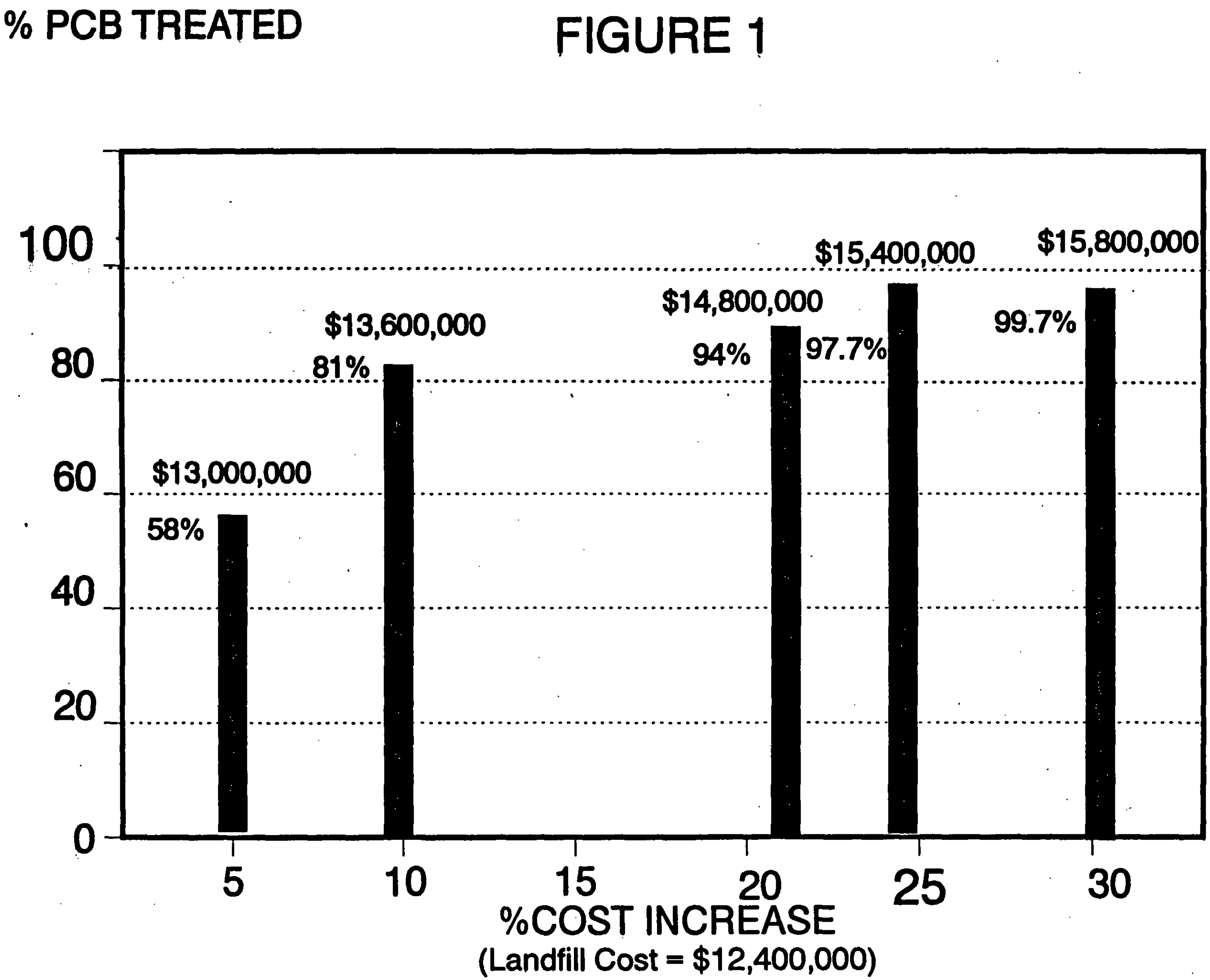
TRANSPORTATION 3.5 (200) (13 + 18) = \$ 21,700

SUBTOTAL ....\$ 5,879,945

TOTAL = 5,879.945 + BASE COST (7,161,919) = \$ 13,041,864

<u>$ 13,000,000</u>

FIGURE 1


% PCB TREATED
100
80
60
40
20
0
$13,000,000
58%
$13,600,000
81%
$14,800,000
94%
$15,400,000
97.7%
$15,800,000
99.7%
5
10
15
20
25
30
%COST INCREASE
(Landfill Cost = $12,400,000)

APPENDIX B

RESPONSE LETTER

ON ARARS

STATE OF MISSOURI

JOHN ASHCROFT
Governor

G. TRACY MEHAN III
Director

Division of Energy
Division of Environmental Quality
Division of Geology and Land Survey
Division of Management Services
Divisionof Parks, Recreation, and Historic Preservation

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176
Jefferson City, MO 65102

March 12, 1991

RECEIVED
MAR 15 1991
REML SECTION

Mr. Steven E. Kinser
U.S. Environmental Protection
Agency, Region VII
726 Minnesota Avenue
Kansas City, KS 66101

Dear Mr. Kinser:

As requested in your March 1, 1991 correspondence, the Missouri Department of Natural Resources (MDNR) has again reviewed the description of the conditions at the Martha C. Rose Chemicals Inc. site as presented in the Remedial Investigation and Feasibility Study (RI/FS). This review was completed by the staff from the Division of Geology and Land Survey and the Division of Environmental Quality's Waste Management and Water Pollution Control Programs. The following determinations have been made regarding identification of State Applicable or Relevant and Appropriate Requirements (ARARs) as they relate to the groundwater at the Rose Chemicals site:

1. The shallow groundwater at this site is not a "usable" aquifer for the following reasons:

   Depth of contamination is limited to groundwater above a shale bedrock;

   This shale bedrock exhibits a low permeability and reduces the possibility of contaminants migrating vertically into the deeper, usable aquifer; and

   Missouri water well laws render the shallow groundwater unusable because of minimum casing lengths.

Collectively, these criteria restrict the contamination to a finite, unusable zone of groundwater.

2. The groundwater at depth, in a more permeable stratum and obtainable by water well laws, would constitute a usable aquifer. However, the RI determined that the contamination was limited in depth and has not migrated into this lower groundwater system ("No

VOCs were detected in samples obtained from any deep well"). No State ARARs were identified for this aquifer, since it is not impacted and, therefore, would not affect the Remedial Action.

3. The discharge of the shallow groundwater into the surface water, as stated in the Risk Assessment (RA), poses some risk attributed to specific usage of that surface water, i.e., beef cattle drinking the water and then being consumed by human populations. Only classified streams are meant to be protected as a long-term source of drinking water for livestock. The Standard's General Criteria prohibit acute toxicity to livestock in unclassified waters, but unclassified waters are not believed to provide a continuous water supply. Bioaccumulation above FDA action levels caused by beef drinking from any waters of the State should be considered an exceedence of the Standard's criteria, however, "...waters... must be free from substances [having] a harmful effect on human life."

   The projected worst case for PCB accumulation is 2-5 ppm; the FDA action level for red meat is 3ppm. With the conservative assumptions made, however, the risk of accumulation to this level would seem to be low.

   The classified stream begins about 2 miles below the Rose Chemicals site. Most of the contaminated sediments are in the first 1/4 mile.

   PCB water concentrations in the 1-2 ppb range at "downstream" locations would seem to be in exceedence of the extremely low allowable concentrations of PCBs in classified streams (for protection of human health-fish consumption), if some locations are in the classified part of the stream. However, MDNR does not believe these waters to be a productive sport fishing area, which would yield enough fish over a 70 year period to cause a human health concern.

   One additional general comment should be included in this response. In the Rose Chemicals site FS, appendix B, page B-2, second paragraph, a reference is made to MDNR's "guidance policy" that aquifers must show minimum yields of 5-10 gpm or have significant impacts on stream recharge. The "guidance policy" referred to was established for underground storage tank removal actions and does not set the standard or authority by which all aquifers in the State of Missouri are definitively determined.

   Enclosed is a list of State of Missouri ARARs or potential ARARs that have been identified for the Rose Chemicals site. For your information, I have also attached an updated table for the Rose site's "Indicator Chemicals" as per the recently revised Missouri Water Quality Standards criteria.

I trust this information adequately addresses the issues you requested responses to. If you require additional clarification or desire further discussion of these issues, please do not hesitate to call.

Sincerely,

WASTE MANAGEMENT PROGRAM

Robert Geller

Robert Geller, Chief
Project Management Unit
Superfund Section

RG:jkp

c: Jim Fels, DGLS
John Howland, WPCP

STATE ACTION-SPECIFIC ARARS
MARTHA C. ROSE CHEMICAL, INC. SITE

STANDARD, REQUIREMENTS, CRITERIA, OR LIMITATION	CITATION	DESCRIPTION	COMMENTS
Missouri Hazardous Waste Management Regulations	10 CSR 25-10.010	Procedures for obtaining State approval for remedial actions at abandoned or uncontrolled sites.	The requirements may be applicable for the Rose Chemical site.
Missouri Hazardous Waste Management Regulations	10 CSR 25-13.010	Standards for management of waste materials or waste manufactured items containing PCBs at concentrations of fifty parts per million or more.	These standards may be applicable/relevant and appropriate requirements for the Rose Chemical site.
Missouri Hazardous Waste Management Regulations	10 CSR 25-6.263	Standards for Transporters of Hazardous Waste.	These requirements may be applicable for the Rose Chemical site if removal offsite of hazardous waste or PCB material.
Missouri Air Quality Standards and Air Pollution Control Regulations.	10 CSR 10-6.	Air Quality Standards and Air Pollution Control Regulations for the State of Missouri.	These requirements may be applicable for the Rose Chemical site if onsite incineration is involved as a remedial action.
Missouri Solid Waste Management Regulations	10 CSR 80	Standards for management of Solid Waste disposal practices.	These requirements may be applicable for the Rose Chemical site if remedial action involves disposal of solid waste in Missouri landfills.

STATE LOCATION-SPECIFIC ARARS
MARTHA C. ROSE CHEMICAL, INC. SITE

STANDARD, REQUIREMENTS, CRITERIA, OR LIMITATION	CITATION	DESCRIPTION	COMMENTS
Missouri Water Quality Standards	10 CSR 20-7.031	Promulgates rules to protect quality of rivers, lakes, streams, and other surface and subsurface waters of the state. Beneficial use of East Pin Oak Creek and its tributary lists livestock watering.	This requirement may be relevant and appropriate for the Rose Chemical site.

STATE CHEMICAL-SPECIFIC ARARS
MARTHA C. ROSE CHEMICAL, INC. SITE

STANDARD, REQUIREMENTS, CRITERIA, OR LIMITATION	CITATION	DESCRIPTION	COMMENTS
Missouri Safe Drinking Water Act and Missouri Water Quality	10 CSR 20-7.031	Maximum chemical contaminant levels and monitoring requirements	The requirements may be relevant and appropriate for the Rose Chemical site.
Missouri Hazardous Waste Management Regulations	10 CSR 25-10.010	Procedures for obtaining state approval for remedial actions at abandoned or uncontrolled sites.	The requirements may applicable for the Rose Chemical site.
Missouri Hazardous Waste Management Regulations	10 CSR 25-13.010	Standards for management of waste materials or waste manufactured items containing PCBs at concentrations of fifty parts per million or more.	These standards may be applicable or relevant and appropriate requirements for the Rose Chemical site.
Missouri Hazardous Waste Management Regulations	10 CSR 25-6.263	Standards for Transporters of Hazardous Waste and PCB's	These requirements may be applicable for the Rose Chemical site if removal offsite of hazardous waste or PCB material.

MISSOURI WATER QUALITY STANDARDS (4)

Indicator Chemicals	Human Health Fish Consumption (mg/L)	Drinking Water (mg/L)	Ground Water (mg/L)	Livestock/ Wildlife Watering (mg/L)
Aroclor 1242/1254/1260	4.5E-08	--	4.5E-08	--
Dichloroethane, 1,1-	--	--	--	--
Dichloroethylene, 1,1-	.0032	0.007	0.007	--
Hexachlorocyclohexane, g-	6.20E-05	2.20E-06	2.20E-06	--
Methylene Chloride	1.6	.0047	.0047	--
Tetrachloroethylene	.009	8.00E-04	8.00E-04	--
Toluene	300	10	10	--
Trichlorobenzene, 1,2,4-	--	--	--	--
Trichloroethane, 1,1,1-	--	0.2	0.2	--
Trichloroethylene	.08	.005	.005	--

(--) No potential ARAR identified.

4) Missouri Water Quality Standards are focused in 10 CSR 20-7.031, Effective March 1991.